

Having thus described the invention, what is claimed is:

1. An elbow fitting for use in effecting directional changes from an inlet pipe to an outlet pipe in a pneumatic product conveying system, comprising:

a circular inlet portion connectable to said inlet pipe to receive a flow of product particles therefrom;

an inlet transition portion connected to said inlet portion and expanding from a generally circular cross-section to an expanded non-circular cross-section having an outer side width dimension that is greater than a diameter dimension of said inlet portion, said inlet transition portion expanding in depth into an outer side of said elbow fitting, an inner side of said elbow fitting maintaining a linear relationship with respect to said inlet portion and said inlet pipe;

a curved expanded portion connected to said inlet transition portion and carrying said width dimension through an angular deflection;

an outlet transitional portion connected to said curved expanded portion to reduce the reduce the cross-sectional area from said expanded non-circular cross-section to said generally circular cross-section; and

an outlet portion having said circular cross-section and being connected to said outlet transitional portion, said outlet portion also being connectable to said outlet pipe to convey said flow of product particles into said outlet pipe.

2. The elbow fitting of Claim 1 wherein said expanded outer side of said elbow fitting causing a reduction of velocity of said flow of product particles from said inlet pipe to create a layer of accumulated product particles along said outer side of said fitting.
3. The elbow fitting of Claim 2 wherein said non-circular cross-sectional area is generally triangular.
4. The elbow fitting of Claim 3 wherein said triangular cross-section is oriented with an apex at said inner side and a base oriented at said outer side of said elbow fitting.
5. The elbow fitting of Claim 4 wherein said outlet transition portion directs said layer of accumulated product particles into said outlet pipe so that said layer of accumulated product particles provides a moving impact zone for incoming higher velocity product particles from said inlet pipe to effect a re-direction of said incoming higher velocity product particles toward said outlet pipe.
6. The elbow fitting of Claim 5 wherein elbow fitting effects a ninety degree directional change to said flow of product particles.

7. The elbow fitting of Claim 5 wherein said elbow fitting effects a forty-five degree directional change to said flow of product particles.

8. A method of effecting a directional change in a flow path of product particles through a pneumatic product conveying systems having an inlet pipe, an outlet pipe and an elbow fitting interconnecting said inlet and outlet pipes to provide structure for effecting said directional change, comprising the steps of:

providing said elbow fitting with an expansion in dimension toward an outer side of said elbow fitting, said expansion of dimension including an increase in depth measured from an inner side of said fitting and an increase in effective width with respect to said inner side;

establishing a layer of accumulated product particles along said outer side of said elbow fitting, said layer of accumulated product particles moving toward said outlet pipe at a velocity slower than a velocity of incoming product particles moving from said inlet pipe into said elbow fitting; and

deflecting said incoming product particles off said layer of accumulated product particles to effect a change of direction of said incoming product particles toward said outlet pipe.

9. The method of Claim 8 wherein said providing step includes providing an inlet transition portion of said elbow fitting to change a cross-sectional configuration of said elbow fitting from a generally circular cross-section at said inlet pipe to an expanded non-circular cross-section in said elbow fitting.

10. The method of Claim 9 wherein said providing step defines said non-circular cross-section as a generally triangular shape with an apex oriented at said inner side and a base at said outer side of said elbow fitting.

11. The method of Claim 10 further comprising the step of:
guiding said layer of accumulated product particles through said elbow fitting toward said outlet pipe so that said layer of accumulated product is constantly moving along said outer side of said elbow fitting.

12. The method of Claim 11 wherein said deflecting step deflects said incoming product particles through an angular deflection of approximately ninety degrees.

13. The method of Claim 11 wherein said deflecting step deflects said incoming product particles through an angular deflection of approximately forty-five degrees.

14. In an elbow fitting for effecting a change of direction of product flow through a pneumatic product conveying system having an inlet pipe and an outlet pipe, said elbow fitting interconnecting said inlet and outlet pipes, the improvement comprising:

an inlet transition portion connected to said inlet portion and expanding from a generally circular cross-section to an expanded non-circular cross-section having an outer side width dimension that is greater than a diameter dimension of said inlet portion, said inlet transition portion expanding in depth into an outer side of said elbow fitting, an inner side of said elbow fitting maintaining a linear relationship with respect to said inlet portion and said inlet pipe;

a curved expanded portion connected to said inlet transition portion and carrying said width dimension through an angular deflection; and

an outlet transitional portion connected to said curved expanded portion to reduce the reduce the cross-sectional area from said expanded non-circular cross-section to said generally circular cross-section.

15. The elbow fitting of Claim 14 wherein said elbow fitting further comprises:

an inlet portion interconnecting said inlet pipe and said inlet transition portion to receive an incoming flow of product particles from said inlet pipe; and

an outlet portion interconnecting said outlet pipe and said outlet transition portion to transfer said flow of product from said elbow fitting to said outlet pipe.

16. The elbow fitting of Claim 15 wherein said inlet portion and said outlet portion have generally circular cross-sections, said inlet and outlet transition portions changing from a generally circular cross-section to an expanded non-circular cross-section, said curved expanded section continuing said non-circular cross-section from said inlet transition portion to said outlet transition portion.

17. The elbow fitting of Claim 16 wherein said non-circular cross-section has a generally triangular shape with an apex at said inner side of said elbow fitting and a base at said outer side of said elbow fitting.

18. The elbow fitting of Claim 17 wherein said expanded outer side of said elbow fitting causing a reduction of velocity of said flow of product particles from said inlet pipe to create a layer of accumulated product particles along said outer side of said fitting.

19. The elbow fitting of Claim 18 wherein said outlet transition portion directs said layer of accumulated product particles into said outlet pipe so that said layer of accumulated product particles provides a moving impact zone for incoming higher velocity product particles from said inlet pipe to effect a re-direction of said incoming higher velocity product particles toward said outlet pipe.

20. The elbow fitting of Claim 19 wherein elbow fitting effects a ninety degree directional change to said flow of product particles.